# Chapter 6
# Representative Plan and Implementation Requirements

This chapter summarizes a representative alternative plan and project implementation requirements. It includes a description and determination of feasibility of a representative alternative plan, identification of areas of risk and uncertainty, unresolved issues, next steps for the Feasibility Report, implementation requirements, Federal and non-Federal responsibilities, project timeline, and status of the Investigation.

## Description of Representative Plan

No specific alternative plan has been chosen or recommended for implementation at this stage of the Investigation, so this chapter describes and evaluates the feasibility of a "representative" plan to illustrate the topics that will be evaluated for a recommended plan that will be identified in the Final Feasibility Report. Based on analyses and evaluations to date in accordance with the Federal planning and NEPA processes, in comparison to the other alternative plans, Alternative Plan 4 best addresses the Investigation planning objectives (highest rank for effectiveness), has a high certainty of achieving the intended benefits (completeness), has a relatively high economic efficiency, and provides the greatest net benefits. Therefore, Alternative Plan 4 was selected as the representative plan for evaluation in this chapter.

Changes and refinements may occur to the alternative plans after this Draft Feasibility Report with input from agencies, stakeholders, and the public; changes in CVP and SWP operational constraints and studies; and other relevant water resources projects and programs, such as BDCP efforts. These potential changes and refinements would be addressed in the Final Feasibility Report and EIS/EIR.

The following sections summarize major components and potential benefits associated with the representative plan (Alternative Plan 4) evaluations.

## Major Components

The major project construction features, or components, of the representative plan (Alternative Plan 4) include the following:

- **Temperance Flat RM 274 Dam and Reservoir** – Temperance Flat RM 274 Dam would be an RCC arch dam located 6.8 miles upstream from Friant Dam. At a top-of-active-storage elevation of 985, the new reservoir would provide about 1,260 TAF additional storage (1,331 TAF total storage, of which 75 TAF would overlap with Millerton Lake), and would have a surface area of about 5,700 acres.

- **Outlet Works** – A 30-foot-diameter, concrete-lined tunnel would be constructed 1.5 miles upstream from the main dam through the south river bank. A SLIS with four inlet elevations would manage reservoir release temperatures. Releases would be made through a 20,000 cfs valve house when not made through the powerhouse.

- **Powerhouse** – The powerhouse would be located approximately 750 feet southwest from the outlet works tunnel exit. The powerhouse would contain two 80 MW turbines, which in combination would pass up to 6,000 cfs. The powerhouse would connect to a new Temperance Flat transmission line that would traverse about 5 miles southeast to the existing Kerckhoff–Sanger transmission line.

- **Recreational Facilities** – Reclamation would protect recreation facilities from inundation, modify existing facilities to replace affected areas (i.e., relocate facilities on site), or abandon existing facilities and replace them at other suitable sites (i.e., relocate facilities off site).

- **Kerckhoff Hydroelectric Project Facilities** – The existing Kerckhoff and Kerckhoff No. 2 powerhouses would be decommissioned. Gates and equipment at the top of Kerckhoff Dam would be modified to accommodate higher tailwater elevations. Existing transmission lines in the inundation area will be relocated or decommissioned.

- **Utilities and Roads** – Impacted utilities include potable water, power distribution, telecommunications, and wastewater facilities. Utilities would be demolished

and/or relocated. Most impacted local roads would be demolished as they are not required for access. Three permanent access roads would be constructed to the dam, intake structure, and valve house/powerhouse.

The representative plan and associated features would be operated to meet the primary objective of water supply reliability by delivering additional water supply to the Friant Division, CVP SOD, and SWP M&I contractors, and the primary objective of ecosystem enhancement by providing a larger cold-water pool and improving the suitability of release temperatures for anadromous fish with additional storage and an SLIS. The operations of Temperance Flat RM 274 Reservoir and Millerton Lake would be coordinated to balance minimum carryover storage-dependent and active storage-dependent benefits and balance the secondary objectives of flood management, recreation, hydropower, and water quality.

## Major Benefits

The potential major benefits of the representative plan (Alternative Plan 4) include the following:

- **Water Supply Reliability** – The representative plan would improve the capacity to capture and store San Joaquin River flows, providing water supply reliability and operational flexibility to the Friant Division and the CVP/SWP SOD system. On average, the representative plan (Alternative Plan 4) would provide 61 TAF per year of additional CVP/SWP systemwide water deliveries. Additional San Joaquin water supply could be provided with less carryover storage (up to 113 TAF), which would decrease other carryover-dependent benefit categories. Alternate future conditions with increased flexibility for CVP and SWP Delta export operations would likely result in significantly greater estimates of water supply reliability from Temperance Flat RM 274 Reservoir with full SWP/CVP system integration.

  The representative plan would provide significant reliability to SOD M&I water users in the event of an emergency that would disrupt Delta exports (e.g., earthquake, levee breach). The representative plan would have an average emergency water supply available to SOD M&I water users of between 28 TAF and 534 TAF, depending on the length of the potential Delta export disruption.

- **Enhance water temperature and flow conditions in the San Joaquin River** – The representative plan would improve the capability, reliability, and flexibility to release water at suitable temperatures and increased flows for anadromous fish downstream from Friant Dam. Temperance Flat RM 274 Reservoir and SLIS would improve the cold water volume for management and release to the San Joaquin River. The representative plan would reduce Friant Dam release temperatures by about 5°F degrees during fall months and slightly extend the distance downstream from Friant Dam where average daily river temperatures stay below 55°F.

  Spring-run Chinook salmon habitat would increase in the San Joaquin River because of improved flow and water temperature for long-term average annual and dry year types. The abundance of spring-run Chinook salmon would improve by a long-term average of 2.8 to 4.9 percent and 11.1 to 13.1 percent in dry years, depending upon SAR condition.

- **Hydropower Generation** – The representative plan would normally operate Millerton Lake at a steady water surface at elevation 550 (minimum carryover storage target of 340 TAF). The fixed elevation and additional reservoir releases would allow Friant Dam powerhouses to generate on average about 15.8 GWh per year more energy. Impacts to the Kerckhoff Project powerhouses would be mitigated.

- **Recreation** – The representative plan would support up to 96,400 new visitor-days. Keeping Millerton Lake at a steady elevation would also improve early-and late-season boating opportunities, and would increase visitation at the lake by about 34,000 visitor-days. The total increase in recreation visitor-days for Alternative Plan 4 would be 130,400.

- **Flood Damage Reduction** – The representative plan would increase active storage available for flood control (at the 90 percent exceedence) by 236 TAF during the flood control period (November through March) compared to the No-Action Alternative.

### Economics

The estimated costs and benefits of the representative plan (Alternative Plan 4) are summarized below:

- **Estimated Costs** – The estimated total investment cost of the representative plan is $2,578 million. The estimated total annual cost for investment and other annualized costs is $115.9 million.

- **Estimated Benefits** – The total estimated average annual monetary benefit of the representative plan is $81.3 million without ecosystem benefits and ranges from $140.8 to $156.9 million with ecosystem benefits (considering California-level valuation with low and high SAR). The resulting annual net economic benefits under the same conditions range from $24.9 to $41.0 million, including California-level ecosystem benefits.

## Determination of Feasibility

This section summarizes the technical, environmental, economic, and financial feasibility of the representative plan (Alternative Plan 4). A project feasibility determination includes the following four elements:

- Technical feasibility consists of engineering, operations, and constructability analyses verifying that it is physically and technically possible to construct, operate, and maintain the project.
- Environmental feasibility consists of analyses verifying that constructing or operating the project will not result in unacceptable environmental consequences to endangered species, cultural, Indian trust, or other resources.
- Economic feasibility consists of analyses verifying that constructing the project is an economically sound investment of capital (i.e., that the project would result in positive net benefits or that the project's benefits would exceed the costs).
- Financial feasibility consists of examining and evaluating project beneficiaries' ability to pay for their share of project costs and/or repay their appropriate portion of the Federal investment in the project over a period of time, consistent with applicable law.

### Technical Feasibility

The representative plan is projected to be technically feasible, constructible, and can be operated and maintained. Revisions to feature designs such as the dam type and diversion scheme have been incorporated into feature designs and cost estimates based on senior review by Reclamation through the 2007 *Design, Estimating, and Construction* (DEC) *Review* (Reclamation 2007b) and 2011 *Value Planning Study* (Reclamation 2011c). Designs and cost estimates of project features in this Draft Feasibility Report have been developed primarily to a feasibility-level, but will not be suitable for use for congressional authorization and appropriation until the Final Feasibility Report. Approximately 13 percent of the total field cost is at an appraisal-level with the most significant features being the LLIS, and river outlet works tunnel and portals (see the Engineering Summary Appendix for details).

Additional review, including a feasibility-level DEC review, will be completed once Draft Feasibility Report comments on engineering features from public agencies and stakeholders have been addressed. The feasibility-level DEC review could identify remaining significant items not listed in the cost estimate and needed refinements to construction methods and scheduling. Responses to feasibility-level DEC review comments will be incorporated in the Final Feasibility Report.

Operations of the representative plan are technically feasible under existing laws, infrastructure, and operating agreements. Potential refinements to the operations of the representative plan include further consideration of the balance between active storage and carryover storage, and formulating and evaluating additional scenarios that balance economic and financial and feasibility with stakeholder support. Additional coordination with water management stakeholders to gather their input on operations priorities and scenarios will also take place before completion of the Final Feasibility Report. The representative plan may be even more feasible under potential future conditions with BDCP, which have not been specifically evaluated to date. Potential additional analysis includes development and evaluation of scenarios that would include representation of a new Delta conveyance to facilitate integration of Temperance Flat 274 operations with the CVP and SWP SOD system. Water supply benefits are expected to increase significantly under these scenarios, although other benefit categories, such as M&I water quality and emergency water supply, may decrease with a change in Delta conveyance in the without-project conditions.

## Environmental Feasibility

Environmental analyses conducted to date suggest that the representative alternative plan would be environmentally feasible. Environmental effects analysis conducted to date includes the following:

- Terrestrial biological resources analyses, including detailed habitat assessments and surveys for threatened and endangered species, for the Temperance Flat RM 274 Reservoir inundation area and areas associated with most project features

- Wetland delineations for the Temperance Flat RM 274 Reservoir inundation area and areas associated with most project features

- Aquatic biological resources analyses for Millerton Lake and the Temperance Flat RM 274 Reservoir inundation area, and the San Joaquin River below Friant Dam

- Cultural resources analyses for Millerton Lake and the Temperance Flat RM 274 Reservoir inundation area and areas associated with most project features

The alternative plans will be evaluated further in the Draft EIS/EIR, and are anticipated to further demonstrate environmental feasibility. Implementation of the alternative plans would affect environmental resources in the primary and extended study areas, with beneficial effects on some resources, and adverse effects on other resources. Potential environmental effects will be evaluated and mitigation measures for each alternative plan will be identified in the Draft EIS/EIR. An environmentally preferable alternative, consistent with NEPA, will be identified in the ROD. Based on studies to date, the representative plan appears to provide the greatest environmental benefits; however, it is recognized that further refinement and changes may occur to the alternative plans based on additional analyses and responses to comments by concerned agencies, stakeholders, and the public.

Implementation of the representative alternative plan would affect environmental resources in the primary and extended study areas, as summarized in Table 5-10. Beneficial effects of constructing Temperance Flat RM 274 Dam and Reservoir, along with operations of the dam and other related CVP and SWP facilities, correspond to the following resource areas:

- Fisheries and aquatic ecosystems (San Joaquin River, Friant Dam to Merced River)
- Flood management (San Joaquin River, Friant Dam to Merced River)
- Groundwater (CVP/SWP facilities and water service areas)
- Surface water supplies and facilities operations (CVP/SWP facilities and water service areas)
- Surface water quality (San Joaquin River, Friant Dam to Merced River, and CVP/SWP facilities and water service areas)
- Recreation (Temperance Flat RM 274 Reservoir and vicinity)
- Socioeconomics, population, and housing (CVP/SWP facilities and water service areas)

Some adverse effects anticipated for constructing the representative plan would be temporary, construction-related effects and would be less than significant or would be reduced to less-than-significant levels with mitigation. These effects correspond to surface water quality, geology and soils, public health and hazardous materials, recreational resources, transportation, circulation and infrastructure, and utilities and service systems.

Other adverse effects would be permanent, such as effects within the newly inundated area of Temperance Flat RM 274 Reservoir and vicinity on fisheries and aquatic ecosystems, botanical and wetlands, wildlife, cultural, land use planning and agricultural resources, power and energy, and visual resources. Long-term adverse effects on power and energy resources would be reduced through replacement power generation infrastructure and mitigation. Some adverse effects, like temporary, construction-generated emissions and noise that exceed local thresholds, would remain significant and unavoidable despite mitigation measures.

As part of the project planning and environmental assessment process, Reclamation and the CEQA lead agency will incorporate certain environmental commitments and best management practices into any alternative plan recommended

for implementation to avoid or minimize potential effects. Reclamation has also committed, contingent on congressional authorization, to coordinate the planning, engineering, design and construction, and O&M phases of the project with applicable resource agencies. Specific actions to avoid, mitigate, and/or compensate for potential adverse environmental effects will be identified and addressed in the Draft and Final EIS/EIR to the greatest extent practicable.

## Economic Feasibility

The representative plan is projected to be economically feasible, because the estimated benefits exceed the estimated costs, resulting in positive net benefits of $24.9 to $41.0 million annually, and benefit-cost ratio of 1.21 (high SAR) to 1.35 (low SAR) (considering California-level ecosystem benefits) or 4.08 (high SAR) to 4.99 (low SAR) (considering US-level ecosystem benefits). Alternative Plan 4 has the highest net benefits of the alternatives evaluated in this Draft Feasibility Report.

Additional monetary benefit categories could be analyzed for the Final Feasibility Report, if any are identified, and an appropriate valuation methodology is available. Potential supplemental refinements to alternative features, hydropower mitigation strategies, and their associated cost estimates for the Final Feasibility Report may also have an effect on the relative economic feasibility of the alternatives.

## Financial Feasibility

Financial feasibility determination during the planning stage consists of (1) a preliminary allocation and assignment of estimated construction, IDC, and operations and maintenance (O&M) costs to project purposes, both reimbursable and nonreimbursable; (2) identification of potential project beneficiaries; and (3) determination of project beneficiaries' potential ability to pay the allocated and assigned costs. This process informs the Federal decision maker and other non-Federal partners of the appropriateness of the investment in the overall project.

On the basis of analysis completed to date, Alternative Plan 4 provides the highest net NED benefits. For this reason, Alternative Plan 4 is used as an example in the following subsections to characterize the potential financial feasibility of a representative alternative plan for this Draft Feasibility Report. The financial feasibility of the recommended plan will be documented in the Final Feasibility Report.

### *Preliminary Cost Allocation*

Reclamation law and policy require an allocation of costs to components or projects purposes to (1) test financial feasibility of reimbursable components or purposes by comparing estimated project costs with anticipated revenues during the feasibility study process, and (2) establish and measure compliance with project financial requirements after construction and determine the final cost allocation. A preliminary cost allocation for the recommended plan will be included in the Final Feasibility Report. The final cost allocation would be performed when the project or significant portions of the project are completed.

**Methodology**

Cost allocations are made for Federal multipurpose water resources projects to derive an equitable distribution of project costs among authorized project purposes, or those purposes proposed for authorization. Once costs are allocated to project purposes, repayment of the costs is assigned to the project beneficiaries. Beneficiaries include agricultural and M&I water agencies, power agencies, as well as State and Federal taxpayers. The three basic steps associated with cost allocation and assignment are (1) identifying costs to be allocated, (2) allocating costs to project purposes, and (3) determining cost assignment for reimbursability and repayment.

The preferred method, as noted in the P&G, of cost allocation for Federal water projects is known as the Separable Cost−Remaining Benefits (SCRB) approach (WRC 1983). The SCRB approach includes the following steps:

- Separable costs (costs that have been added to a multi-purpose project to specifically serve a given function) are identified for each purpose. Separable costs include specific costs, or costs of individual facilities that serve only a single purpose.

- Separable costs are subtracted from the lesser of benefits or single-purpose alternative project costs (costs of the most economical alternative that would likely be built as a Federal-type project to provide equivalent benefits of for a single purpose) to derive remaining benefits, also known as the justifiable expenditure.

- Joint costs (costs of identifiable physical facilities that serve more than one, and often several, purposes) are allocated in proportion to the distribution of remaining benefits.

- The total cost allocated to a purpose is the sum of its separable and allocated joint costs.

At this stage of the Investigation, single-purpose alternative project costs have not been developed, a recommended plan has not been selected, and separable costs have not been determined. In the Draft Feasibility Report, the Alternative Justifiable Expenditure (AJE) approach is used for a preliminary cost allocation of a representative alternative plan (Alternative Plan 4). The AJE method is a modified SCRB method used when separable costs and single-purpose alternative costs have not been derived. AJE cost allocation follows the same process as the SCRB method, except that specific costs (costs of individual facilities that serve only a single purpose) are used in place of separable costs.

The AJE method may give similar results to the SCRB method if the majority of separable costs are specific to each purpose. In addition, it is likely that any single-purpose alternative costs would exceed each purpose's benefits and not affect the justifiable expenditure calculation. Single purpose alternative costs would likely exceed the multi-purpose project benefits because one way to achieve many of the benefits provided by the multi-purpose project would be to construct a smaller dam in the upper San Joaquin River basin. The cost of a smaller dam in the upper San Joaquin River basin would likely be greater than the benefit of any single category. The full SCRB method will be used for the Final Feasibility Report.

**Costs to be Allocated**

Costs to be allocated include annualized construction costs (including field costs and non-contract costs), IDC, O&M costs, additional pumping costs, and annual hydropower mitigation costs. It should be noted that cost allocation is a financial analysis rather than an economic evaluation. Consequently, project costs may be presented differently in a cost allocation than in the NED analysis.

Table 6-1 provides the estimated costs to be allocated for the representative plan. See the Engineering Summary Appendix for details on alternative plan features and cost estimates. Total estimated construction costs and IDC of the representative plan

are $2,216 million and $361 million, respectively, and sum to a total investment cost of $2,578 million. Estimated annual costs total $115.9 million and include annualized investment costs and other annual costs (O&M, additional hydropower mitigation, and additional pumping).

**Table 6-1. Representative Plan Costs to be Allocated ($ million)**

| | |
|---|---|
| **Total Construction Cost[1]** | **$2,216** |
| Interest During Construction | $361 |
| **Total Investment Cost[1]** | **$2,578** |
| **Annual Costs** | |
| Interest and Amortization[2] | $99.2 |
| Annual Operation and Maintenance | $8.4 |
| Additional Hydropower Mitigation Cost[3] | $4.2 |
| CVP/SWP Additional Pumping Cost[4] | $4.1 |
| **Total Annual Cost[1]** | **$115.9** |

Note:

[1] Project features and costs are described in detail in the Engineering Summary Appendix. Costs are presented in millions at a January 2013 price level. All numbers are rounded for display purposes; therefore, line items may not sum to totals.

[2] 100-year period of analysis, and 3.75 percent interest rate (federal discount rate).

[3] Additional hydropower mitigation is the estimated value of the impacted Kerckhoff Hydroelectric Project energy and ancillary services minus the Temperance Flat Reservoir powerhouse energy and ancillary services value.

[4] The additional CVP/CWP pumping costs do not include water conveyance costs beyond the net power requirement for delivering the new water supply, and additional costs may be incurred.

Key:

CVP = Central Valley Project

SWP = State Water Project

### Project Purposes for Preliminary Cost Allocation

For this preliminary cost allocation, the benefit categories are grouped into five purposes. The two primary project purposes for cost allocation are water supply and ecosystem/fish and wildlife enhancement. Benefit categories associated with the water supply purpose include agricultural water supply reliability, M&I water supply reliability, M&I water quality, and emergency water supply. The benefit category associated with the ecosystem/fish and wildlife enhancement purpose is improvements in habitat for anadromous fish. Benefit categories associated with project opportunities include flood damage reduction, recreation, and hydropower. Project purposes for which benefits have not been monetized are not included in this preliminary cost allocation analysis.

## Cost Allocation Assumptions

The representative plan has several project features that can be identified as individual facilities that serve only a single purpose. The following assumptions apply to the identification of specific costs and joint costs:

- Specific costs have been identified for the SLIS associated with the ecosystem/fish and wildlife enhancement purpose.
- Specific costs have been identified for the boat ramp providing access associated with the recreational purpose.
- For hydropower generation, the power feature costs are not considered specific costs because the features are necessary for hydropower mitigation of the inundated Kerckhoff Project powerhouses associated with the multipurpose project. Therefore, hydropower feature costs are considered joint costs.
- Recreational feature costs associated with replacement of the existing recreational facilities that would be inundated by the alternative plan are not considered specific costs because those costs are necessary for the multipurpose project.

### *Cost Assignment*

The cost allocation process is designed so that costs associated with project purposes are assigned for cost sharing and/or repayment. Once costs are allocated to project purposes, repayment of the costs is assigned to the project beneficiaries. Beneficiaries include agricultural and M&I water agencies, power agencies, as well as State and Federal taxpayers. Costs allocated to project purposes are assigned as reimbursable or nonreimbursable. Based on existing legislation, costs allocated to agricultural and M&I water supply and hydropower purposes are fully reimbursable to the Federal government by the beneficiaries.

**Reimbursable costs** are borne by beneficiaries via construction cost sharing, or repaid via rates or repayment contracts.

**Nonreimbursable costs** are borne by the Federal, state, or local government via tax or bond revenues because the benefits generally accrue to taxpayers.

## Federal Authority

Repayment for Federal water resources projects is based on the principle that beneficiaries pay for benefits received. For the Investigation, the general principle for repayment of the Federal investment to construct a water resources project is established by the Reclamation Project Act of 1939, Section 7(b):

> *For any project, division of a project, development unit of a project, or supplemental works on a project, now under construction or for which appropriations have been made, and in connection with which the repayment contract has not been executed, allocations of costs may be made in accordance with the provisions of section 9 of the Act and a repayment contract may be negotiated,…*

Current authorities related to reimbursability of the Federal investment are summarized in Table 6-2 for each of the project purposes and benefit categories within those purposes. The preliminary cost assignment may be revised in the Final Feasibility Report, pending further developments with potential inclusion of other construction cost-share partners.

**Table 6-2. Existing Authorities for Federal Financial Participation in Multipurpose Water Resources Projects**

| Purpose | Pertinent Federal Legislation | Description |
|---|---|---|
| **Agricultural Water Supply** | Reclamation Act of 1902, as amended | Reimbursable. This act provides for up-front Federal financing of agricultural water supply purposes, with 100% repayment of investment costs and O&M costs by the beneficiaries. |
| **M&I Water Supply** | Reclamation Act of 1939, as amended | Reimbursable. This act provides for up-front Federal financing of M&I water supply purposes, with 100% repayment of investment costs (including construction costs, IDC, and interest over the repayment period); 100% of O&M costs are paid by the beneficiaries. |
| **Emergency Water Supply** | | |
| **M&I Water Quality** | | |
| **Hydropower** | Reclamation Act of 1906, as amended | Reimbursable. Similar to M&I water supply. |
| **Fish and Wildlife Enhancement** | Federal Water Project Recreation Act of 1965 (Public Law 89-72), as amended | Public Law 89-72 provides Federal non-reimbursable share of up to 75% and non-Federal share of at least 25% for fish and wildlife enhancements. |
| **Recreation** | Federal Water Project Recreation Act of 1965, as amended by the Reclamation Recreation Management Act (Public Law 102-575) | Public Law 102-575 provides Federal nonreimbursable share of up to 50% for separable investment costs and non-Federal share of 100% for O&M. |
| **Flood Damage Reduction** | Reclamation Project Act of 1939, Section 9(c) | Nonreimbursable. |

Key:
IDC = interest during construction
M&I = municipal and industrial
O&M = operations and maintenance

**State Authority**

California's comprehensive water legislation, SB 1, enacted in 2009, gave the Commission new responsibilities regarding the distribution of public funds set aside for the public benefits of water storage projects, and developing regulations for the quantification and management of those benefits. If passed by California voters, Chapter 8 of SBX7-2 would provide general obligation bond funds for water infrastructure and for various projects and programs to address ecosystem and water supply issues in California, including funds for statewide water system operational improvement.

Under the Safe, Clean and Reliable Drinking Water Act, the Commission is further tasked with selecting water storage projects for potential State bond funding toward project benefits "that improve the operation of the state water system, are cost effective, and provide a net improvement in ecosystem and water quality conditions." If this or another bond measure passes, funds may be eligible for public benefits resulting from construction and operation of Temperance Flat RM 274 Dam and Reservoir.

Projects that could be funded by the State under SBX7-2 would be selected by the Commission through a competitive public process ranking potential projects based on the expected return for public investment as measured by the magnitude of the public benefits provided. The public benefits categories defined by SBX7-2 include:

> *(1) Ecosystem improvements, including changing the timing of water diversions, improvement in flow conditions, temperature, or other benefits that contribute to restoration of aquatic ecosystems and native fish and wildlife, including those ecosystems and fish and wildlife in the Delta.*
>
> *(2) Water quality improvements in the Delta, or in other river systems, that provide significant public trust resources, or that clean up and restore groundwater resources.*
>
> *(3) Flood control benefits, including, but not limited to, increases in flood reservation space in existing reservoirs by exchange for existing or increased water storage capacity in response to the effects of changing hydrology and*

> *decreasing snow pack on California's water and flood management system.*
>
> *(4) Emergency response, including, but not limited to, securing emergency water supplies and flows for dilution and salinity repulsion following a natural disaster or act of terrorism.*
>
> *(5) Recreational purposes, including, but not limited to, those recreational pursuits generally associated with the outdoors.*

Section 79746 of Chapter 8 of SBX7-2 provides the formula to calculate the amount of potential State funding for a water storage project:

> *"79746 (a) The public benefit cost share of a project funded pursuant to this chapter, other than a project described in subdivision (c) of Section 79741, may not exceed 50 percent of the total costs of any project funded under this chapter.*
>
> *(b) No project may be funded unless it provides ecosystem improvements as described in paragraph (1) of subdivision (a) of Section 79743 that are at least 50 percent of total public benefits of the project funded under this chapter." (Emphasis added)*[1]

Subsection (a) limits the amount of public funding that may be expended for any project, other than a conjunctive use or reservoir reoperation project, under SBX7-2 to a maximum of 50 percent of the *total cost of the project* (Commission 2013). For example, if the total cost of a project funded is $1,000,000, the maximum public contribution would be $500,000. But it is important to note that because the 50 percent rule is a State funding cap, the public contribution percentage could also be less.

Subsection (b) clarifies that 50 percent of "the total public benefits of the project funded under this chapter" not "the project" overall must be attributable to ecosystem benefits to

[1] Section 79743 defines "ecosystem improvements" to include: "changing the timing of water diversions, improvement in flow conditions, temperature or other benefits that contribute to restoration of aquatic ecosystems and native fish and wildlife, including those ecosystems and fish and wildlife in the Delta."

maximize the State funding. If non-ecosystem public benefits exceed ecosystem public benefits, then the difference is not eligible for funding (Commission 2013). As such, whatever percentage is determined to be appropriate for public cost-share funded under subsection (a), *at least* half of that amount must be attributable to ecosystem benefit improvements.

**Cost Assignment Assumptions**

Table 6-3 shows potential cost assignment percentages used in this analysis for purposes of repayment. The assignment percentage assumptions are based on pertinent Federal and State legislation described above and assumptions about potential implementation agreements. As this is a preliminary cost allocation of a representative plan, assignment percentages may be updated for the preliminary cost allocation for the recommended plan in the Final Feasibility Report.

**Table 6-3. Potential Cost Assignment Percentages**

| Purpose | Reimbursable | | Federal Nonreimbursable | | State/Local Nonreimbursable | |
|---|---|---|---|---|---|---|
| | Investment | O&M | Investment | O&M | Investment | O&M |
| **Water Supply** | | | | | | |
| Agricultural Water Supply Reliability | 100% | 100% | – | – | – | – |
| M&I Water Supply Reliability | 100% | 100% | – | – | – | – |
| Emergency Water Supply | – | – | – | – | 100% | 100% |
| M&I Water Quality[1] | 100% | 100% | – | – | – | – |
| **Fish and Wildlife Enhancement** | | | | | | |
| Ecosystem | – | – | 50% | 50% | 50% | 50% |
| **Hydropower** | 100% | 100% | – | – | – | – |
| **Recreation** | – | 100% | 50% | – | 50% | – |
| **Flood Damage Reduction** | – | – | 50% | 50% | 50% | 50% |

Note:
[1] Water quality improvements for specific beneficiaries are assumed to be reimbursable to Federal, state, or local governments. Delta water quality improvements may be a broad public benefit and nonreimbursable.
Key:
M&I = Municipal and Industrial
O&M = operations and maintenance

***Results***

Table 6-4 provides the results of the preliminary cost allocation procedure using the AJE approach and NED benefits and costs estimates for the representative plan. Total benefits including ecosystem enhancement benefits accruing to California residents are used for preliminary cost allocation. Ecosystem benefits accruing to California residents represent the middle of the range of estimated ecosystem benefits and were used for this preliminary cost allocation given potential State bond funding and uncertainty in ecosystem benefit results. See the Economic Analysis Appendix for benefit estimate methodologies and results for all Alternative Plans evaluated. See the Engineering Summary Appendix for details on all alternative plans' features and cost estimates.

The ecosystem/fish and wildlife enhancement and recreational purposes include specific costs that can be separated from the remaining costs. The remaining benefits, and the proportion by category, are shown in the table after removing specific costs. The allocated joint costs are calculated by apportioning the remaining costs. Finally, the allocated costs for each benefit category are the sum of specific costs and allocated joint costs. Based upon this procedure, the largest share of total annual costs of $115.9 million is allocated to ecosystem/fish and wildlife enhancement (spring-run Chinook salmon habitat), followed by emergency water supply.

Cost assignment of project costs between the Federal government and non-Federal beneficiaries is presented in Table 6-5 for the AJE approach. Costs are assigned by applying the preliminary assignment percentages shown in Table 6-3. As indicated in Table 6-5, $32.1 million, or 28 percent, of annual project costs is anticipated to be Federal nonreimbursable. The remaining 72 percent ($31.8 + $51.9 = $83.7 million) of annual project costs would be either reimbursable by the project beneficiaries or funded by State and/or local tax or bond revenues.

**Table 6-4. Preliminary Annual Cost Allocation for Representative Plan ($ million)**

| Purpose | Annual Benefits[1,2] | Specific Costs[3] | Remaining Benefits (Justifiable Expenditure)[4] | % Distribution of Remaining Benefits | Allocated Joint Costs[5] | Total Allocated Costs[6] | Overall % Cost Allocation |
|---|---|---|---|---|---|---|---|
| **Water Supply** | **$68.3** | **$0.0** | **$68.3** | **45.0%** | **$49.8** | **$49.8** | **43.0%** |
| Agricultural Water Supply Reliability | $18.9 | $0.0 | $18.9 | 12.5% | $13.8 | $13.8 | 11.9% |
| M&I Water Supply Reliability | $22.3 | $0.0 | $22.3 | 14.7% | $16.3 | $16.3 | 14.0% |
| Emergency Water Supply | $27.1 | $0.0 | $27.1 | 17.9% | $19.8 | $19.8 | 17.1% |
| M&I Water Quality | $0.0 | $0.0 | $0.0 | 0.0% | $0.0 | $0.0 | 0.0% |
| **Ecosystem/ Fish and Wildlife Enhancement** (Spring-Run Chinook Salmon Habitat) | **$75.6** | **$4.8** | **$70.8** | **46.7%** | **$51.6** | **$56.4** | **48.7%** |
| **Hydropower**[7] | **$1.6** | **$0.0** | **$1.6** | **1.1%** | **$1.2** | **$1.2** | **1.0%** |
| **Recreation** | **$7.4** | **$0.4** | **$7.0** | **4.6%** | **$5.1** | **$5.5** | **4.8%** |
| **Flood Damage Reduction** | **$4.0** | **$0.0** | **$4.0** | **2.6%** | **$2.9** | **$2.9** | **2.5%** |
| **TOTAL** | **$156.9** | **$5.2** | **$151.7** | **100.0%** | **$110.6** | **$115.9** | **100.0%** |

Notes:
[1] Annual benefits used for this preliminary cost allocation are displayed in Table 5-9 for Alternative Plan 4. California-level ecosystem benefits with low SAR are used for this preliminary cost allocation. See Table 5-3 for a more detailed summary of the range of ecosystem benefit estimates.[2] Annual benefits are the justifiable expenditure for each purpose because sing le-purpose alternative costs have not been estimated at this stage in the Investigation. It is likely that any single-purpose alternative costs will exceed each purpose's benefits and not affect the justifiable expenditure calculation.
[3] Specific costs are used instead of separable costs with the AJE approach. Including separable costs may change allocated joint cost percentages.
[4]Remaining benefits = Benefits less separable costs, but must be greater than $0. Remaining benefits are the remaining justifiable expenditure after specific costs have been removed from each project purpose.
[5] Total project costs less sum of separable costs, times share of remaining benefits.
[6] Sum of specific costs and allocated joint costs.
[7] Hydropower values represent only hydropower at Friant Dam.

Key:
% = percent
AJE = alternative justifiable expenditure
M&I = Municipal and Industrial
SAR = smolt-to-adult return rate

**Table 6-5. Preliminary Annual Cost Assignment for Representative Plan ($ million)**

| Purpose | Total Allocated Costs | Reimbursable | Federal – Nonreimbursable | State/Local – Nonreimbursable |
|---|---|---|---|---|
| **Water Supply** | **$49.8** | **$30.1** | **$0.0** | **$19.8** |
| Agricultural Water Supply Reliability | $13.8 | $13.8 | $0.0 | $0.0 |
| M&I Water Supply Reliability | $16.3 | $16.3 | $0.0 | $0.0 |
| Emergency Water Supply | $19.8 | $0.0 | $0.0 | $19.8 |
| M&I Water Quality | $0.0 | $0.0 | $0.0 | $0.0 |
| **Ecosystem/Fish and Wildlife Enhancement** (Spring-Run Chinook Salmon Habitat) | **$56.4** | **$0.0** | **$28.2** | **$28.2** |
| **Hydropower**[1] | **$1.2** | **$1.2** | **$0.0** | **$0.0** |
| **Recreation** | **$5.5** | **$0.6** | **$2.5** | **$2.5.** |
| **Flood Damage Reduction** | **$2.9** | **$0.0** | **$1.5** | **$1.5** |
| **TOTAL Assigned Cost** | **$115.9** | **$31.8** | **$32.1** | **$51.9** |

Notes: General. Cost and benefit information is based on annual values.
General. Line item values may not sum to total due to rounding.
[1] Hydropower values represent only hydropower at Friant Dam.
Key: M&I = municipal and industrial

***Payment Capacity/Ability to Pay***

Financial feasibility is ultimately based on the ability of project beneficiaries to pay the costs associated with a recommended plan. If beneficiaries have the financial resources to pay the costs allocated to them, then the project is considered financially feasible. In the context of this Investigation, ability to pay analysis is necessary to assess the financial capacity of non-Federal project beneficiaries to absorb additional costs associated with benefits they would receive under the recommended plan. For the Draft Feasibility Report, the preliminary ability to pay analysis for agricultural and M&I water supply beneficiaries is presented for illustrative purposes. Alternative Plan 4 is used as a representative alternative plan in the analysis. Further ability to pay analysis will be performed for the Final Feasibility Report with the recommended plan.

Ability to pay evaluations vary by the water supply purpose. Typically, agricultural water user ability to pay analyses include a crop budget analysis for a typical farm that is aggregated to the water district level. The most common measures for municipal water supply are the percent of median household income and other socioeconomic measures. Commercial and industrial water users' ability to pay can be estimated by comparing gross revenues to necessary non-water supply expenses.

**Agricultural Water Supply Beneficiaries**

For agricultural water supply beneficiaries, the ability to pay analysis is completed following a payment capacity study, which considers net incomes to representative farms within the irrigation district through a crop budget analysis. The ability to pay is defined as the farm-level payment capacity aggregated to the entire irrigation district, less existing district obligations, O&M costs, power costs, and reserve fund requirements. Non-farm related income to the district is also incorporated to assess the district's annual loan amortization capacity (Reclamation 2004c).

An initial ability to pay analysis for potential agricultural water supply beneficiaries was developed in 2011 for four regions of the CVP using four representative contractors. Table 6-6 displays the representative ability to pay per acre-foot results for agricultural water supply beneficiaries in each region (Reclamation, 2011d).

**Table 6-6. Ability to Pay Results for Four Representative CVP Agricultural Contractors**

| | Friant/ San Joaquin River | Sacramento River | South of Delta | Northern Sacramento |
|---|---|---|---|---|
| Ability to Pay ($/acre-foot) | 7.50 | 324.55 | 150.59 | 97.40 |

*Source: Reclamation 2011d*

Key:
CVP = Central Valley Project
Delta = Sacramento-San Joaquin Delta

Financial feasibility is determined by comparing the beneficiaries' ability to pay with the annualized repayment of construction costs, IDC, and OM&R costs. Table 6-7 summarizes the allocated agricultural water supply costs for the representative plan, which were estimated as follows:

- Construction costs allocated to the agricultural water supply purpose (shown in Table 6-7) are estimated to be $263.7 million by multiplying the agricultural water supply reliability overall cost allocation percentage (11.9 percent) displayed in Table 6-4 by the total construction cost ($2,216 million) displayed in Table 6-1. No IDC is allocated to agricultural water supply beneficiaries.

- Annual agricultural water supply repayment cost ($6.6 million) is then calculated over a 40-year repayment period with no interest.

- Annual agricultural water supply O&M and additional hydropower mitigation costs are calculated by multiplying the agricultural water supply reliability overall cost allocation percentage (11.9 percent) displayed in Table 6-4 by their respective costs displayed in Table 6-1.

- Additional CVP annual pumping costs are estimated to be $0.6 million based on LTGen power modeling documented in the Modeling Appendix.

- Total annual agricultural water supply costs over the 40-year repayment period ($8.7 million) are the sum of annual agricultural water supply repayment, O&M, additional hydropower mitigation, and additional CVP pumping costs.

**Table 6-7. Representative Plan Allocated Agricultural Water Supply Costs ($ million)**

| **Total Construction Cost[1]** | **$263.7** |
|---|---|
| **Annualized Costs** | |
| Agricultural Water Supply Repayment Cost (40-year repayment with no interest) | $6.6 |
| Operations and Maintenance | $1.0 |
| Additional Hydropower Mitigation Cost | $0.5 |
| Central Valley Project Additional Pumping Cost | $0.6 |
| **Total Annual Agricultural Water Supply Cost[1] (40-Year Repayment)** | **$8.7** |

Note:
[1] Project features and costs are described in detail in the Engineering Summary Appendix. Costs are presented in millions at a January 2013 price level.

Financial feasibility for agricultural water supply was evaluated by comparing the representative beneficiaries' ability to pay with potential agricultural water costs developed with two scenarios. Scenario 1 is based on the assumption that the increment of agricultural water supply from the representative plan is fully integrated into the CVP to meet existing contracts. The CVP Irrigation Ratesetting Policy (Reclamation 1988) would be used to recover O&M costs and provide repayment of construction costs through water service contracts. Scenario 2 assumes the increment of agricultural water supply from the representative plan would require new repayment contracts

with existing CVP and SWP contractors who are willing and able to pay the incremental costs to receive the incremental benefits. For both scenarios, the fully integrated and incremental costs of the project would be repaid over a 40-year period.

An increase in the annual cost of agricultural water supply of $6.6 million would be allocated to CVP agricultural water supply contractors for repayment (Table 6-7). To derive the increase in the cost of water using Scenario 1, the total annual agricultural water supply cost $8.7 million is divided by the 5-year average of total annual CVP water deliveries, 2.2 million acre-feet (Reclamation 2011d). This results in a marginal increase of agricultural water of $3.95 per acre-foot ($3 for repayment and $0.95 for other annualized costs). This marginal increase would fall within the ability to pay for each of the four representative contractors.

For Scenario 2, financial feasibility was also determined by comparing the beneficiaries' ability to pay the annualized costs. At present, the specific agricultural contractors have not been identified beyond the general groupings of CVP Friant Division and CVP SOD. If new contracts were identified, the $8.7 million in allocated agricultural water supply costs would be spread over an average annual increase of 41,000 acre-feet, and the cost per acre-foot is estimated at $212 for CVP agricultural water supply contractors ($161 for repayment and $51 for other annualized costs). Specific analysis for any contractor would be conducted to provide a determination of financial feasibility.

**Municipal and Industrial Beneficiaries**

For municipal water supply beneficiaries, ability to pay and payment capacity of potential beneficiaries is estimated with an "affordability threshold" represented as a percent of median household income. This analysis applies the affordability threshold established by the EPA. In 1980, the EPA Office of Drinking Water completed a study to assess the costs of complying with new drinking water regulations. The study determined that costs of water service exceeding 2.5 percent of household income were not affordable (EPA 1980). For this analysis, the EPA affordability threshold of 2.5 percent of median income is applied to estimate payment capacity. A range of affordability thresholds from other analyses were also considered in this analysis but were not applied because they lacked regional relevance to the study area.

The alternative plans have the potential to provide water supply benefits to a range of SWP M&I water contractors. As a result, this preliminary payment capacity analysis is estimated based on a range of representative SWP M&I contractors that could receive project water supplies, and representative regional data was used rather than data specific to individual water agencies. Service area population data for a range of 10 potential SWP M&I water supply beneficiaries was obtained from 2010 urban water management plans, and the number of households was estimated with U.S. Census Bureau data (U.S. Census Bureau 2013) by dividing the population estimates by the median household size for the county that comprises the majority of each water agency's service area. Similarly, median household income levels were obtained from county-level data for the county that comprises the largest portion of each water service provider's service area.

In this analysis, the estimated number of households in 2030 within each water service area is used to estimate payment capacity. Table 6-8 provides the average payment capacity analysis results for the 10 representative SWP M&I contractors. As described above, payment capacity is estimated as 2.5 percent of median household income. To account for existing water payments, an estimate of current water rates for Southern California residential customers (obtained from Raftelis Financial Consultants, Inc. and American Water Works Association 2011) is subtracted from the estimate to arrive at the estimated additional payments that are available to support new water projects. As shown in Table 6-8, the annual average estimated total payment capacity of representative municipal and industrial contractors is approximately $690 million. Total estimated annual payment capacity of representative M&I beneficiaries is approximately $6.9 billion.

**Table 6-8. Average Payment Capacity Results for Representative Municipal and Industrial Contractors**

| Average Estimated Households in 2030 | Average Median Household Income ($[1]/hhld/yr) | Average Estimated Current Water Rates ($[1]/hhld/yr) | Average Household Payment Capacity ($[1]/hhld/yr) | Average Estimated Total Payment Capacity ($[1]/yr) |
|---|---|---|---|---|
| 826,307 | $61,642 | $646 | $895 | $692,301,067 |

Note: [1] Dollars are presented at a January 2013 price level.
Key: hhld = household
yr = year

Financial feasibility is determined by comparing the beneficiaries' ability to pay with the annualized repayment of construction costs, IDC, and O&M costs. Table 6-9 summarizes the allocated M&I water supply costs for the representative plan, which were estimated as follows:

- Investment costs allocated to the M&I water supply purpose (shown in Table 6-9) are estimated to be $361.9 million by multiplying the M&I water supply reliability overall cost allocation percentage (14.0 percent) displayed in Table 6-4 by the total investment cost ($2,578 million) displayed in Table 6-1. IDC is allocated to M&I water supply beneficiaries.

- Annual M&I water supply repayment cost ($22.1 million) is then calculated over a 40-year repayment period with 5.357 percent annual interest rate (U.S. Department of Treasury 2013).

- Annual M&I water supply, O&M and additional hydropower mitigation costs are calculated by multiplying the M&I water supply reliability overall cost allocation percentage (14.0 percent) displayed in Table 6-4 by their respective costs displayed in Table 6-1.

- Additional SWP annual pumping costs are estimated to be $3.5 million based on SWP_Power modeling documented in the Modeling Appendix.

- Total annual M&I water supply costs over the 40-year repayment period ($27.4 million) are the sum of annual M&I water supply repayment, O&M, additional hydropower mitigation, and additional SWP pumping costs.

This analysis assumes the increment of M&I water supply from the representative plan would require repayment contracts with existing CVP and SWP contractors who are willing and able to pay the incremental costs to receive the incremental benefits. In addition to the M&I water supply repayment cost, the analysis assumed the M&I beneficiaries would need the payment capacity for other allocated annualized costs.

**Table 6-9. Representative Plan Allocated Municipal and Industrial Water Supply Costs ($ million)**

| | |
|---|---|
| **Total Investment Cost[1]** | **$361.9** |
| **Annualized Costs** | |
| M&I Water Supply Repayment Cost (40-year repayment with interest[2]) | $22.1 |
| Operations and Maintenance | $1.2 |
| Additional Hydropower Mitigation Cost | $0.6 |
| SWP Additional Pumping Cost | $3.5 |
| **Total[3] Annual M&I Water Supply Cost[1] (40-Year Repayment)** | **$27.4** |

Notes:
[1] Project features and costs are described in detail in the Engineering Summary Appendix. Costs are presented in millions at a January 2013 price level.
[2] 5.357 percent annual interest rate (U.S. Department of Treasury 2013).
[3] All numbers are rounded for display purposes; therefore, line items may not sum to total.

Key:
M&I = municipal and industrial
SWP = State Water Project

Financial feasibility was determined by comparing the representative beneficiaries' payment capacity with the annualized costs. At present, the specific M&I water supply beneficiaries have not been identified beyond SWP M&I contractors generally. If new contracts were identified, for the representative plan, the $27.4 million in allocated M&I water supply costs would be spread over an average annual increase of 21,000 acre-feet, and the cost per acre-foot is estimated at $1,305 for M&I water supply beneficiaries ($1,054 for repayment, and $251 for other annualized costs). The allocated cost to M&I beneficiaries would be significantly less than the average payment capacity for representative M&I contractors.

# Risk and Uncertainty

Certain assumptions were made for aspects of this report based on engineering and scientific judgment. Careful consideration was given to methodologies and evaluations for hydrology and system operations, cost estimates, and economic analyses, as described in the Modeling Appendix, Engineering Summary Appendix, and Economic Analysis Appendix. Analyses were developed with advanced modeling and estimating tools using historical data and trends and projected future conditions. While this is effective in helping predict outcomes for alternative operations, costs, and economic values, many uncertainties could affect the findings of this Draft Feasibility Report. Various risks and uncertainties associated with the Investigation are discussed below.

## Hydrology and Climate Change

Potential climate change could produce conditions different from those for which current water management infrastructure and operations were designed. The magnitude of climate change is widely debated. The State is investing significant resources to study how global climate changes could affect the way California receives and stores water. Results indicate that climate changes in the State could affect hydrology, water temperatures for fish, and future operations for both flood management and water supply deliveries.

California could experience changes in temperature, precipitation, and snow level (DWR 2013a). Any measurable change in these climate indicators could affect future water operations in California. According to the California Water Plan Update (DWR 2013a), more studies are needed before definitive answers can be given:

> *Uncertainties will never be eliminated, but better data collection and management and improved analytical tools will allow water and resource managers to better understand risks within the system. Many water agencies in California have begun incorporating climate change information into their operation and planning process to reduce uncertainty of how climate may affect California's water resources in the future. Additional efforts are needed to develop the accurate climate data needed to reduce uncertainty and risk in California water management in the future.*

Additional information on climate change is included in the Modeling Appendix Attachment C.

## Water Supply Reliability and Demands

Water supplies and demands will continue to be subject to annual variability. Demands are expected to exceed supplies in the future. There are numerous variables considered in forecasting expected future water supply and/or shortages in California and, just as important, numerous opinions regarding these variables, depending on the growth scenarios anticipated. The California Water Plan (DWR 2013a) estimates demand for different growth scenarios, ranging from "slow and strategic growth," that is slower than currently projected, to "expansive growth," which assumes that population growth will be faster than currently projected, with nearly 70 million people living in California in 2050. Potential for an overall reduction in future demands for agricultural water supplies has been predicted. Reasons for this are conversion from agricultural to urban land uses and implementation of more efficient irrigation water applications.

### *Future Land Use*

Population growth is a major factor in California's future water picture. California's population is expected to increase by just over 60 percent by 2050. Population growth could force some of the existing water supplies currently identified for agricultural uses to be redirected to urban uses. Certainly, some portion of increased population growth in the Central Valley would occur on lands currently used for irrigated agriculture. Therefore, water that would have been needed for these lands for irrigation would instead be used to serve replaced urban demands. However, this would only partially offset the required agricultural-to-urban water conversion, since much of the growth would occur on nonirrigated agricultural lands. If it was assumed that all of the urban growth in the Central Valley would occur on lands currently under irrigation, this would only account for up to about 40 percent of expected future conversion needs. The remainder of the agricultural-to-urban water conversion would be required to help sustain urban growth primarily in other areas of the State.

### *Efficiency in Water Use*

While agricultural interests are ever improving in irrigation efficiencies, technology is also being used to be more efficient with all of the supplies that can be acquired. Challenges are greatest during dry years and droughts because in drier years, water dedicated to the environment is curtailed and less water is available for agriculture. Users who have already increased efficiency may find it more challenging to achieve additional water use reductions during droughts.

## San Joaquin River Ecosystem Enhancement

Anadromous fish are highly affected by changes in their habitat conditions. Predicting anadromous fish survival is difficult because of many influencing factors; therefore, the models used to predict fish habitat for this Draft Feasibility Report contains assumptions with varying levels of uncertainty.

Limited data exists on the survival of San Joaquin River Chinook salmon as they migrate below the Merced River to the ocean, and then return to spawn (referred to as the SAR), and no SAR data exist that could be directly related to a potential spring-run Chinook population in the San Joaquin River. SAR is known to vary widely between years, largely controlled by ocean conditions or variation in other environmental conditions. These conditions make the SAR especially uncertain.

Without Chinook salmon in the San Joaquin River, an accurate SAR cannot be estimated and used in the modeling. Hypothetical spring-run life histories and a SAR value were developed based on expert advice from the SJRRP Fisheries Management Work Group and were consistent with observed rates for other anadromous fish in the Sacramento-San Joaquin River system (Barnett-Johnson et al. 2008, Buchanan et al. 2013). Results were developed to demonstrate a range of potential results for a low and high potential SAR to account for the uncertainty and limited data. The alternative plans are anticipated to have beneficial effects in support of the Restoration and Water Management goals of the Settlement, including enhancing San Joaquin River habitat for anadromous fish and increasing the volume of Restoration Flows eligible for recapture. There may be numerous other effects that could be the subject of future studies and coordination. The effects of the alternative plans on the SJRRP will continue to be evaluated.

### Water System Operations Analysis

Water operations modeling performed for this Draft Feasibility Report was based primarily on operational constraints described in the 2008 OCAP BA (Reclamation 2008c), the 2008 USFWS BO (USFWS 2008a), and the 2009 NMFS BO (NMFS 2009) and associated RPAs. Ongoing consultation processes for the 2008 USFWS and 2009 NMFS BOs have resulted in some uncertainty in future CVP and SWP operational constraints. In response to lawsuits challenging the 2008 and 2009 BOs, the District Court remanded the BOs to USFWS and NMFS in 2010 and 2011, respectively, and subsequently ordered consultation to be reinitiated and preparation of new BOs. These legal challenges may result in changes to CVP and SWP operational constraints if the revised USFWS and NMFS BOs contain new or amended RPAs.

Federal planning policies were used to help estimate which future projects may or may not be implemented; projects were deliberately either included or excluded from water operations models and evaluations. Some projects included in the without-project condition, if not implemented, could influence the findings of this Draft Feasibility Report. Also, some projects not accounted for in the models could change the findings of this Draft Feasibility Report if they are implemented. Changes in Delta exports could also influence future water operations. In addition, changes in hydrology could produce conditions that are different than current water operations were designed for.

Modeling studies may be updated to reflect changes in water operations resulting from ongoing consultation of the Coordinated Long-Term Operation of the CVP and SWP, and other relevant water resources projects and programs, including BDCP efforts. Any updated studies will be incorporated into future Investigation documents.

Implementation of a BDCP alternative could affect the estimated benefits of Investigation alternative plans. The following discussion describes the nature of potential effects.

### *Analysis of Potential Bay Delta Conservation Plan Alternatives*

The BDCP is being prepared collaboratively by Federal, State, and local agencies, environmental organizations, and other interested parties. The BDCP is intended as a comprehensive conservation strategy for the Delta, designed to advance the coequal planning goals of restoring ecological functions of the Delta and improving water supply reliability for large portions of the State of California.

A range of alternatives for providing Delta species/habitat protection and improving water supply reliability is being evaluated through development of an EIS/EIR. The current CEQA Preferred Alternative outlined in the BDCP Draft EIS/EIR and includes a dual-conveyance water delivery system that would consist of new isolated north Delta diversion facilities and the existing SWP/CVP export facilities in the south Delta (Reclamation, USFWS, NMFS, and DWR 2013). The north Delta diversion would be the primary diversion point and would be operated in conjunction with the existing south Delta diversion; the existing south Delta diversion would only operate on its own when the north Delta diversion is nonoperational during infrequent periods for maintenance or repair. Facilities associated with the new north Delta diversion described under the current CEQA Preferred Alternative, Conservation Measure 1 – Water Facilities and Operation, include the following (Reclamation, USFWS, NMFS, and DWR 2013):

- Three new intakes with pumping plants located along the Sacramento River, each with an intake capacity of 3,000 cfs
- An intermediate forebay located near the town of Hood
- A dual-bore 40-foot-inside-diameter tunnel with conveyance capacity of 9,000 cfs by gravity flow from the location of the new intermediate forebay to Clifton Court Forebay

The following discussion describes how implementation of the BDCP could affect the existing system, and how the estimated benefits of Investigation alternative plans could change if a BDCP alternative was implemented.

**Water Supply Reliability**
All Investigation alternative plans were formulated specifically to increase CVP and SWP water deliveries and water supply reliability. Isolated north Delta diversion facilities implemented as part of the BDCP could increase water deliveries to CVP and SWP SOD water users and improve water quality for urban and agricultural water users. Implementation of the Temperance Flat RM 274 Dam and Reservoir in combination with any BDCP alternative would likely provide greater water supply benefits than implementing either proposed project independently. Temperance Flat RM 274 could increase system flexibility and provide for even greater water supply reliability with implementation of BDCP through operations integration. However, the magnitude of the combined benefits would be dependent upon the BDCP alternative recommended for implementation.

**Ecosystem Enhancement**
All Investigation alternative plans were formulated specifically to benefit anadromous fish in the San Joaquin River, with a specific focus on improving San Joaquin River water temperature conditions downstream from Friant Dam. The BDCP is anticipated to improve habitat conditions in the Delta for anadromous fish species and increase the survival of out-migrating salmonids in the Delta. The potential effects of BDCP implementation on ecosystem enhancement benefits for the Investigation are unknown.

**Planning Opportunities**
Investigation benefits for hydropower generation, flood damage reduction, recreation, and urban water quality could also be affected for Investigation alternative plans if BDCP is implemented. Increases in water supply reliability due to system flexibility and potential use of new Delta conveyance facilities could change average water levels in Temperance Flat RM 274 Reservoir and Millerton Lake, affecting planning opportunities. However, the magnitude and timing of these affects are unknown.

## Cost Estimates

Cost estimates developed for alternative plans included in this report are based on January 2013 price levels and a 100-year period of analysis. Varying uncertainties are associated with the material and unit costs used to develop the estimates. Unknowns include the future price of construction materials and labor costs. In particular, the construction market has experienced extreme price volatility in the last several years.

A significant market anomaly occurring from 2002 to 2009 skews the calculation of forward cost trends using short-term linear regression techniques.

Although the recent economic downturn has resulted in price decreases, it is expected that prices will continue to escalate over the long term. While future inflation trends are difficult to predict, new market forces (e.g., higher material commodity pricing, energy costs, lack of competition) will likely continue to have significant impacts on heavy civil infrastructure construction costs for the foreseeable future. Because of uncertainty and variability among the short-term regressions, a longer view of the market is preferred. Consequently, while forward cost trends are always difficult to predict, there is some basis to believe that cost escalation is normalizing back to historical levels at approximately 3 percent to 4 percent per year. An allowance for escalation from the January 2013 price level to the Notice to Proceed milestone was not included in the cost estimate. Future studies and coordination should be undertaken to determine an appropriate escalation factor to be used for budgetary approval.

### Alternative Refinements

Alternative formulation is an iterative process with the intent to lead to identification of a recommended plan for Federal and/or non-Federal consideration. The alternative plans described in this report could evolve as the Draft Feasibility Report and pending Draft EIS/EIR are reviewed by the public and stakeholders. In addition to some of the other areas of uncertainty described herein, potential adjustments in potential mitigation, and consideration of system integration with other CVP and SWP water supplies and demands. This iterative process is important in refining alternatives to ensure that the plan ultimately chosen as the recommended plan best addresses the planning objectives and Federal and/or State criteria.

## Unresolved Issues

As the Investigation progresses toward project implementation, issues will evolve that need to be addressed and resolved. Multiple subject areas need to be addressed during upcoming phases of the Investigation, as described below. In addition, the pending Draft EIS/EIR will contain additional discussion related to areas of controversy and unresolved issues. All reasonable efforts will be made to resolve such issues in the Final Feasibility Report and EIS/EIR.

### Non-Federal Partner

To date, interest has been expressed in a potential project implementation to address the identified Investigation planning objectives. Support has been expressed by representatives of CVP contractors, DWR, and other water supply interests.

If authorized for construction, a recommended plan would likely require a portion of its costs to be reimbursed by a non-Federal partner(s). Reimbursable costs include agricultural water supply, M&I water supply and quality, and hydropower.

### Native American and Cultural Resources

This Draft Feasibility Report and pending Draft EIS/EIR are consistent with the National Historic Preservation Act (NHPA), Section 106. The Draft and Final EIS/EIR will describe supporting analyses, studies, coordination, impacts, and mitigation, as necessary. Tribal groups will continue to have the opportunity to participate, and are anticipated to continue to provide input to the Investigation through the Section 106 process as an invited consulting party, as well as through the NEPA process.

### Environmental Impacts and Mitigation Requirements

Many detailed environmental resources studies have been conducted for the Investigation in support of feasibility analyses and environmental impact assessments. Some of the results of these analyses are documented in this report. The assessment of potential impacts of alternative plans on environmental resources, along with proposed mitigation measures, will be documented in the pending Draft EIS/EIR.

Details about offsite opportunities to mitigate impacts on biological resources in the primary study area are not yet available. Potential mitigation lands containing wetland and special-status species habitat comparable to habitat that would be affected by constructing Temperance Flat RM 274 Dam and

Reservoir have been identified near the study area. How conservation and enhancement efforts on these lands may be applied for mitigation of loss of habitat will be discussed in more detail in future documents.

## Special Designations

During development of the Draft Bakersfield RMP and EIS (2011 and 2012), BLM completed a preliminary suitability determination of river segments located within the RMP area for inclusion under the National Wild and Scenic Rivers System (NWSRS). Based on criteria from the BLM Manual 8351 (BLM 1993) and the Interagency Wild and Scenic Rivers Coordinating Council Guidelines on Wild and Scenic Rivers Suitability (Interagency Wild and Scenic Rivers Coordinating Council 1999), BLM concluded a preliminary determination to suggest that the San Joaquin River segment from Kerckhoff Dam to Kerckhoff Powerhouse is suitable for inclusion in the NWSRS.

The BLM cannot administratively designate a stream via a planning decision or other agency decision into the NWSRS, and the San Joaquin River segment from Kerckhoff Dam to Kerckhoff Powerhouse is not designated or will not be automatically designated as part of the NWSRS. Next steps for inclusion of this segment in the NWSRS would include congressional determination of suitability or nonsuitability, or Secretary of Interior determination of suitability or nonsuitability and submittal of reports to the president. The president would then report recommendations to the Congress, and propose designation of the San Joaquin River segment from Kerckhoff Dam to Kerckhoff Powerhouse under the NWSRS. Inclusion of the San Joaquin River segment from Kerckhoff Dam to Kerckhoff Powerhouse under the NWSRS may affect the Investigation.

## Water Rights

To facilitate implementation of the alternative plans and associated operations, Reclamation may need to amend its existing water right permits on the San Joaquin River for Friant Dam operations. Potential changes could include the location(s) and amounts for direct diversion for consumptive use and storage, season(s) of diversion and storage, purposes of use, and the place of use. Additional project measures such as transfers, exchanges, modifications to hydropower operation, dedicated in-stream flow releases, or emergency supply may need additional water right petitions. Other components of the alternative plans, such as transfers, exchanges, hydropower

operations modifications, releases for ecosystem, and emergency supply, may require addition al water right petitions.

Reclamation would comply with the CWC to pursue a petition of change to its existing water rights for implementing the preferred plan. The EIS/EIR will contain the necessary information to support the State Water Board's discretionary action on deciding on a potential petition, including compliance with CEQA. Before approving any potential water right petitions, the State Water Board, under CWC Section 1707, would be required to find that (1) the proposed change would not increase the amount of water Reclamation is entitled to use, and (2) the proposed change would not unreasonably affect any legal user of water. As part of the petition, Reclamation may provide supplemental information, including overriding considerations, if any.

### Hydropower Mitigation

The onsite hydropower replacement option (powerhouse connected to the outlet works of Temperance Flat RM 274 Reservoir), combined with additional mitigation as needed, would be cost effective and is Reclamation's preferred power mitigation option for the Investigation. Additional powerhouse refinements may be conducted before completing the feasibility study. Further refinements in unit number, size, and operation could be considered. Additional operational scenarios could be evaluated in the future that may further improve the value of onsite hydropower mitigation. Scenarios that could be considered include integrating operations of Temperance Flat RM 274 Reservoir with other CVP and SWP SOD facilities, which would increase the amount of water stored in Temperance Flat RM 274 Reservoir (and corresponding head for generation) through exchange or changes in carryover storage levels. Additional mitigation components may also be needed and could include a range of onsite and offsite power generation and transmission actions. These actions could potentially replace previous proposed mitigation actions. Hydropower mitigation issues will continue to be coordinated with affected stakeholders during development of the Final Feasibility Report.

# Next Steps for Feasibility Study

This Draft Feasibility Report is a significant milestone in the Investigation. As the Investigation progresses, Reclamation will continue to evaluate and refine alternative plans and address unresolved issues and concerns. Based on the findings of the Investigation to date, the following items comprise the next steps.

## Solicit Input on Draft Feasibility Report

Reclamation will solicit public input on this report.

## Alternative Plan Refinement

As the Investigation progresses, Reclamation will continue to refine and evaluate alternative plans to respond to public comments and reflect potential changes to existing and likely future conditions. Additional refinement of alternative plans is expected based on public and stakeholder input on the Draft Feasibility Report and Draft EIS/EIR and updates to operations modeling and economic studies. Conditions in the San Joaquin River basin and Delta are also complex and subject to change.

Operations studies may be updated to reflect water operations resulting from ongoing consultation of the Coordinated Long-Term Operation of the CVP and SWP and other relevant water resources projects and programs, including, potentially, BDCP efforts. The results of these updated studies would be incorporated into future Investigation documents. Future studies based on updated water operations would require revising several models and related analyses to reflect potential changes for each of the project resource areas.

## Environmental Compliance Documentation and Mitigation Requirements

Reclamation will prepare, release, and solicit input on the separate Draft EIS/EIR. The Draft and Final EIS/EIR will include an evaluation of environmental effects and mitigation measures for each alternative plan, consistent with NEPA. Compliance documents will also be prepared to address potential impacts to special-status species protected under the ESA. The environmentally preferable alternative will be identified in the ROD. Preliminary cost allowances for environmental mitigation were prepared for this report. Environmental mitigation costs will be updated to reflect detailed plans and cost estimates for specific activities to mitigate impacts on environmental resources, which will be identified in the Draft and Final EIS/EIR.

### Update Economic and Financial Evaluations

Future economic and financial evaluations will focus on updating estimates of benefits of the alternative plans, and further refining the preliminary allocation of costs to project purposes using the SCRB method. If authorized for construction, the proposed plan would require a portion of its costs to be shared and/or reimbursed by a non-Federal partner(s). Reclamation also plans to refine analyses for the financial capability of project beneficiaries. Further efforts are also planned to identify and confirm specific non-Federal partner(s) and beneficiaries. In addition, if the SBX7-2 bond measure passes, Reclamation will investigate use of bond funding for the public benefits of Temperance Flat RM 274 Dam and Reservoir.

### Refine Feature Designs and Update Cost Estimates

Upcoming activities to support continued feature designs include performing additional geologic investigations, and refining feature designs and cost estimates, including river outlet works and diversion plan, additional low-level outlet, reservoir clearing, and affected facilities. Facility cost estimates will be updated with current unit pricing and escalation. Estimates for non-contract costs will also be refined, including project area lands requirements, and environmental and cultural resources mitigation costs consistent with mitigation requirements identified in the Draft and Final EIS/EIR.

### Selection of Recommended Plan/Preferred Alternative

At this stage of the Federal planning process, a representative plan is presented but a recommended plan has not been identified. Further refinement and changes may occur to the alternative plans after input from agencies, stakeholders, and the public.

### Continued Coordination and Evaluations

As the Investigation progresses, Reclamation will continue to coordinate with stakeholders and other agencies to address and resolve issues related to water rights, Native American and cultural resources, biological investigations and mitigation, non-Federal partner(s), special designations, and hydropower mitigation. Reclamation will continue to coordinate activities with other relevant projects and programs, including BDCP, SJRRP, and the RPAs resulting from the consultation process for the Coordinated Long-Term Operation of the CVP and SWP.

# Implementation Requirements

After the feasibility study is completed the following requirements would need to be addressed before the project could be implemented.

### Feasibility Report Approval

The Final Feasibility Report would be submitted by the Commissioner of Reclamation to the Secretary of the Interior. The Secretary may accept or revise the Final Feasibility Report. After review by the Office of Management and Budget, in accordance with Executive Order 12322, the Secretary would transmit a Final Feasibility Report, Final EIS, and ROD to the U.S. Congress to determine the type and extent of Federal interest in the project. The Secretary may recommend any of the alternatives considered, including No-Action.

### Federal Project Authorization and Funding

If Congress authorizes project construction, the authorized project would be included in either an appropriation act or the president's budget based on (1) national priorities, (2) magnitude of the Federal commitment, (3) level of local support, (4) willingness of the non-Federal partner(s) to fund its share of the project costs, and (5) budgetary constraints that may exist at the time of construction.

### Non-Federal Project Authorization and Funding

Federal funding may be supplemented by State or local funding in various ways. If passed by voters, State or local bonds could provide funds to pay costs allocated to State or local taxpayers. For example, if passed by California voters, Chapter 8 of SBX7-2 would provide general obligation bond funds for various projects and programs to address ecosystem and water supply issues and these funds may be eligible for public benefits of a recommended plan.

### Regulatory and Related Requirements for Environmental Compliance

Construction and operations of any recommended plan would be subject to applicable requirements of Federal, State, and local laws, policies, and environmental regulations. Reclamation would need to obtain various permits and regulatory authorizations before any project construction could begin.

In addition to NEPA requirements, major permits and approvals potentially required for project implementation are shown in Table 6-10. These would be in addition to compliance with a number of environmental regulatory requirements as part of the NEPA process.

**Table 6-10. Summary of Potential Major Permits and Approvals for Project Implementation**

| Agency Permit/ Approval | Recommended Prerequisites for Submittal[1] | Estimated Processing Time[2] | Anticipated Fees |
|---|---|---|---|
| **Federal** | | | |
| **USACE**<br>Clean Water Act Section 404<br><br>Rivers and Harbors Act Section 10 Permit | • Application<br>• ESA compliance document for submittal to USFWS/NMFS/CDFW<br>• Section 401 Water Quality Certification permit or application<br>• NEPA documentation (environmental compliance documents)<br>• NHPA, Section 106 compliance documentation<br>• Wetland delineation<br>• CWA, Section 404 (b)(1) evaluation and identification of the Least Environmentally Damaging Practical Alternative<br>• Mitigation and monitoring plan | 24 months | $100 for Individual permit (may be waived for government permitees) |
| **USFWS/NMFS**<br>Endangered Species Act Section 7 Consultation | • Regular formal and informal technical consultation<br>• ESA compliance document<br>• Draft Biological Assessment | 18 months | None |
| **NMFS**<br>**Essential Fish Habitat Assessment** | • Regular formal and informal technical consultation<br>• Biological Assessment<br>• Draft environmental compliance documents | 18 months | None |
| **USFWS**<br>Fish and Wildlife Coordination Act | • Service agreements among USFWS, NMFS, and CDFW<br>• Regular Informal technical coordination<br>• Draft environmental compliance documents | 12 months | None |
| **USFWS**<br>Bald and Golden Eagle Protection Act | • Application<br>• EIS/EIR compliance document<br>• Pre-construction survey report(s)<br>• Eagle management Plan | TBD | TBD |
| **SHPO[3]/ACHP**<br>National Historic Preservation Act, Section 106 | • Historic Property Inventory Report<br>• Native American consultation<br>• Impacts to Indian trust resources and sacred sites<br>• Environmental compliance documents | 24 months | None |
| **BLM**<br>Special-Use Permits (e.g., livestock grazing, forest products) | • Application | TBD | TBD |

**Table 6-10. Summary of Potential Major Permits and Approvals for Project Implementation (contd.)**

| Agency Permit/ Approval | Recommended Prerequisites for Submittal[1] | Estimated Processing Time[2] | Anticipated Fees |
|---|---|---|---|
| **State** | | | |
| **Central Valley Water Board**<br>Clean Water Act Section 401 | • Application<br>• Fish and Game Code Section 1602 application<br>• CWA Section 404 permit or application<br>• Draft environmental compliance documents<br>• Mitigation and monitoring plan (if needed) | 6 months | $500+ |
| **CDFW**<br>California Endangered Species Act Section 2081—Incidental Take Permit<br>or<br>2080.1 Consistency Determination | • Informal technical consultation<br>• Application, if requesting a 2081 Incidental Take Permit<br>• Biological opinion and incidental take statement, if requesting a consistency determination | 9 months | None |
| **CDFW**<br>**Fish and Game Code Section 1600 Streambed Alteration Agreement** | • Application<br>• CWA Section 401 Water Quality Certification permit or application<br>• CWA Section 404 permit or application<br>• Draft environmental compliance documents<br>• Mitigation plan | 9 months | $4,000 |
| **State Water Board**<br>Amended Water Right | • Application<br>• Draft (possibly final) environmental compliance documents | 12 months | $440,000 |
| **State Lands Commission**<br>Land Use Lease | • Application<br>• Draft environmental compliance documents | 9 months | $25 |
| **State of California Department of Transportation**<br>Encroachment Permit | • Application<br>• Permit Engineering Evaluation Report | 60 days | None |
| **California Department of Conservation**<br>California Surface Mining and Reclamation Act Permit | • Application | TBD | TBD |

**Table 6-10. Summary of Potential Major Permits and Approvals for Project Implementation (contd.)**

| Agency Permit/ Approval | Recommended Prerequisites for Submittal[1] | Estimated Processing Time[2] | Anticipated Fees |
|---|---|---|---|
| **Local** | | | |
| **Fresno and Madera Counties** Construction-Related Permits | • Demolition, grading, building, mechanical, and utility construction and encroachment permits; and easements | TBD | TBD |
| **SJVAPCD** Dust Control Plan | • Dust Control Plan<br>• Dust Control Training Course<br>• Preapplication meeting (encouraged) | 2 months | TBD |
| **SJVAPCD** Authority to Construct and Permit to Operate | • Application<br>• Preapplication meeting (encouraged)<br>• Required conformity and inclusion in the State Implementation Plan | 6 months | $75 |

Notes:
[1] All permit applications require detailed project description information.
[2] Anticipated processing time is estimated based on submittal of initial permit applications to permit issuance.
Key:
ACHP = Advisory Council on Historic Preservation
BLM = U.S. Department of the Interior, Bureau of Land Management
CDFW = California Department of Fish and Wildlife
Central Valley Water Board = Central Valley Water Quality Control Board
CWA = Clean Water Act
EIR = Environmental Impact Report
EIS = Environmental Impact Statement
ESA = Endangered Species Act
NEPA = National Environmental Policy Act
NHPA = National Historic Preservation Act
NMFS = National Marine Fisheries Service
PRC = Public Resources Code
SHPO = State Historic Preservation Officer
SJVAPCD = San Joaquin Valley Air Pollution Control District
State = State of California
State Water Board = State Water Resources Control Board
USACE = U.S. Army Corps of Engineers
USFWS = U.S. Fish and Wildlife Service

In addition to the major Federal, State, and local environmental requirements detailed in Table 6-10, the proposed plan considered may be subject to other applicable laws, policies, or plans. Table 6-11 summarizes other laws, policies, and plans that may potentially affect the development of any plan.

## Table 6-11. Summary of Applicable Laws, Policies, Plans, and Permits Potentially Required

| Level | Laws, Policies, Plans, and Permits |
|---|---|
| Federal | Federal Endangered Species Act |
| | Section 404 of the Clean Water Act |
| | Rivers and Harbors Act Section 10 |
| | National Historic Preservation Act, Section 106 (1966) |
| | Migratory Bird Treaty Act |
| | Fish and Wildlife Coordination Act |
| | Executive Orders 11990 (Wetlands Policy), 11988 (Flood Hazard Policy), and 12898 (Environmental Justice Policy) |
| | Indian Trust Assets |
| | Americans with Disabilities Act |
| | Rehabilitation Act |
| | Farmland Protection Policy |
| | Federal Transit Administration Activities and Programs |
| | Architectural Barriers Act |
| | Federal Cave Resources Protection Act (1988) |
| | Executive Order 11312 (National Invasive Species Management Plan) |
| | Magnuson-Stevens Fishery Conservation and Management Act |
| | National Wild and Scenic Rivers System |
| | Federal Land Use Policies |
| | Federal Water Project Recreation Act |
| | Millerton Lake Resource Management Plan and General Plan |
| | San Joaquin River Gorge Recreation Area |
| | Federal Energy Regulatory Commission Permitting Requirements |
| | U.S. Army Corps of Engineers, Reservoir Regulation Manual for Flood Control Friant Dam and Reservoir |
| | Uniform Relocations Assistance and Real Properties Acquisition Act of 1970, as amended (Public Law 91-646 and Public Law 100-17) |
| State | California Public Resources Code |
| | Clean Water Act, Section 401 |
| | California Endangered Species Act |
| | California Fish and Game Code, Fully Protected Species |
| | California Fish and Game Code, Section 1600 – Streambed Alteration |
| | Porter-Cologne Water Quality Control Act |
| | California Native Plant Society Species Designations |
| | Reclamation Board Encroachment Permit |
| | California Water Rights |
| | State Lands Commission Land Use Lease |
| | State of California General Plan Guidelines |
| | California Department of Transportation, Encroachment Permit and Activities, Programs |
| | California Land Conservation Act of 1965 (Williamson Act) |
| | California Native Plant Protection Act |
| | California Department of Boating Activities and Programs |
| | California Scenic Highway Program |
| | California Wild and Scenic Rivers Act |
| | Millerton Lake Resource Management Plan and General Plan |
| Local | San Joaquin Valley Air Pollution Control District Dust Control Plan |
| | San Joaquin Valley Air Pollution Control District Authority to Construct and Permit to Operate |
| | California Government Code General Plan Requirements (municipal general plans) |
| | Other Applicable Local Permits and Requirements |

## Advanced Planning and Design Activities

In addition to the environmental compliance efforts described above, other significant advanced planning and design activities would be required before implementation of an action alternative. Several key activities include the following:

- Develop a Definite Plan Report and associated advanced planning studies, including preparing detailed plans, specifications, and bid packages
- Establish agreements for reimbursable project purposes
- Develop and/or revise O&M and related plans
- Acquire required lands

## Federal and Non-Federal Responsibilities

If Congress authorizes a project, Federal and non-Federal obligations and requirements would be contained in a Project Cooperation Agreement (PCA).

### *Federal Responsibilities*

If recommended for implementation, Reclamation and/or future project partners or beneficiaries would perform preconstruction and design studies for the recommended plan, which may require updated economic and/or environmental analyses and documentation. After PCAs are signed and non-Federal partners have provided any required financial contributions and assurances, the Federal Government would acquire real estate and/or relocate displaced parties according to Public Law 91-646 and construct the project modifications and related mitigation requirements. Reclamation and other Federal agencies (e.g., BLM) would be responsible for various O&M activities, as shown in Table 6-12.

**Table 6-12. Potential Federal and Non-Federal Responsibilities for Various Project Component O&M**

| Facility | Responsibility |
|---|---|
| Temperance Flat RM 274 Dam and Reservoir (including outlet works) | Reclamation |
| Temperance Flat RM 274 Powerhouse and Transmission Line | TBD |
| Transmission Line Relocations | PG&E |
| Recreational Facilities (BLM facilities) | BLM |
| Recreational Facilities (reservoir facilities) | State Parks |
| Utilities | Various Non-Federal |

Key:
BLM = U.S. Bureau of Land Management
O&M = operation and maintenance
PG&E = Pacific Gas and Electric Company
Reclamation = U.S. Department of the Interior, Bureau of Reclamation
RM = river mile
State Parks = California Department of Parks and Recreation
TBD = to be determined

### *Non-Federal Responsibilities*

Before implementation, the non-Federal partner(s) for both reimbursable and nonreimbursable costs would agree to perform items of local and state cooperation specific to the authorized purposes of the project. A non-Federal partner needs to be identified for each of the reimbursable project purposes. For most and possibly all of the reimbursable purposes, the non-Federal partner would need to share in the cost of the authorized project.

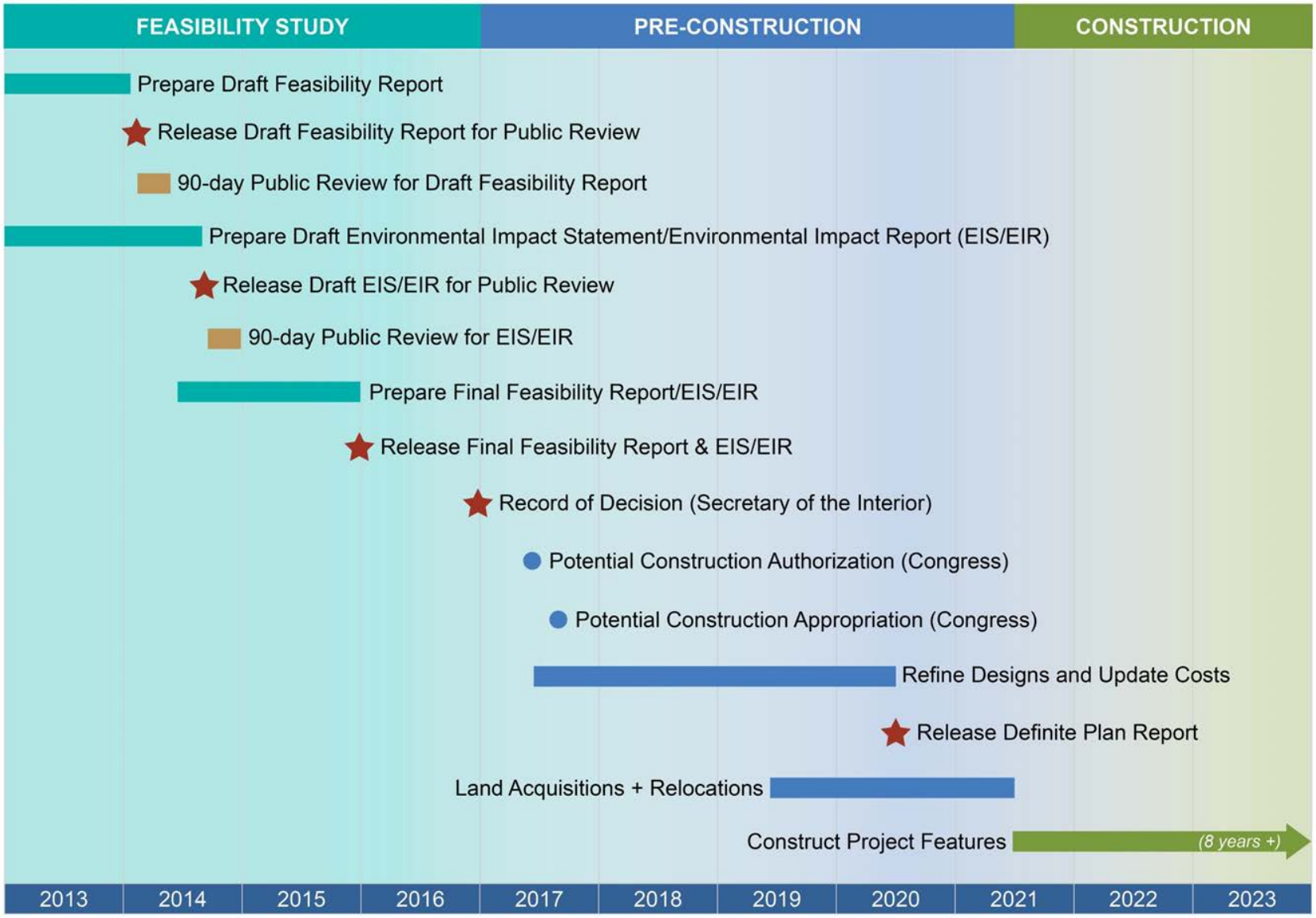
## Timeline and Status of Feasibility Study

Table 6-13 summarizes major activities that have either occurred, or are planned to occur, as a part of the Investigation. A timeline of major actions to complete the Investigation and future milestones leading to project implementation is shown in Figure 6-1. If Congress authorizes a project and appropriates funds, then detailed project designs would be initiated, a Definite Plan Report would be prepared, and any necessary real estate acquisitions could be initiated before initiating project construction. The initial phase of construction-related activities would include acquiring any necessary real estate interests and/or relocating displaced parties according to Public Law 91-646, acquiring necessary permits, and relocating infrastructure within the reservoir area. Construction activities for project features would likely span 8 or more years.

## Table 6-13. Summary and Status of Feasibility Study Activities

| Activity | Description |
|---|---|
| **Completed and Ongoing Activities** | |
| Federal authorization | Federal authorization for the Investigation was initially provided in Public Law 108-7, Division D, Title II, Section 215, the omnibus appropriations legislation for fiscal year 2003, enacted in February 2003. This act authorized the Secretary of the Interior to conduct feasibility studies for several storage projects identified in the CALFED ROD (2000a), including the Investigation.<br>Subsequent authorization for the Investigation and funding was provided in Public Law 108 361, Title I, Section 103, Subsection (d)(1)(A)(ii), the Water Supply, Reliability, and Environmental Improvement Act, signed October 25, 2004. |
| Phase 1 Investigation Report (report issued October 2003) | Evaluated 17 possible reservoir sites in the eastern San Joaquin Valley and selected 6 for continued study, as documented in the Phase 1 report. |
| Formal initiation of environmental compliance processes (NOI/NOP) (February 2004) | Formal initiation of environmental compliance processes began with the NOI/NOP, consistent with Federal and State regulations. |
| Public Scoping (report issued December 2004) | Results of the public scoping process were documented in the Scoping Report. This document reports the results of a series of public scoping meetings held throughout California for the Investigation. |
| Initial Alternatives Information Report (report issued June 2005) | The six reservoir sites retained from Phase 1 were evaluated, and other reservoir storage sites added in response to comments received during public scoping, and identified potential groundwater storage measures. |
| Plan Formulation Report (report issued October 2008) | This report outlines the formulation, comparison, and evaluation of comprehensive alternative plans that address Investigation planning objectives and opportunities. |
| Draft Feasibility Report (report issued January 2014) | The Draft Feasibility Report is a Federal decision document that describes the study process, major results, potential recommended plan, Federal/non-Federal responsibilities and sponsorship, and future actions. |
| Draft EIS/EIR and Related Documents (scheduled for 2014) | The Draft EIS/EIR will provide environmental compliance documentation consistent with NEPA and CEQA for the alternatives presented in the Draft Feasibility Report, which will be incorporated by reference. |
| Washington D.C.-level Review and Processing (scheduled for 2015) | The Final Feasibility Report, Final EIS/EIR, and ROD will be reviewed and processed within the Department of the Interior and the President's Office of Management and Budget before public release. |
| Final Feasibility Report and Accompanying Final EIS/EIR (scheduled for 2015) | Following public and agency review, the Final Feasibility Report and Final EIS/EIR will incorporate responses to comments made on the draft report and include a plan recommended for implementation. |
| ROD (scheduled for 2016) | The Secretary of the Interior will issue a ROD for the Investigation, which will identify the Recommended Plan, identify alternatives considered, including the environmentally preferable alternative; and describe mitigation plans, including any enforcement and monitoring commitments. |
| Congressional Authorization (scheduled for 2017) | Congress will review and vote on whether to authorize the project. Legislation containing construction authorization would be sent to the president for approval. |

Key:
CALFED = CALFED Bay-Delta Program
CEQA = California Environmental Quality Act
EIS/EIR = Environmental Impact Statement/Environmental Impact Report
Investigation = Upper San Joaquin River Basin Storage Investigation
NEPA = National Environmental Policy Act
NOI = Notice of Intent
NOP = Notice of Preparation
ROD = Record of Decision




Note: Subject to refinement/change during remainder of feasibility study.

**Figure 6-1. Upper San Joaquin River Basin Storage Investigation Project Timeline**

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